

FITZ GERALD'S "HIGHEST ANDES."<sup>1</sup>

IN the book entitled "The Highest Andes," Mr. E. A. Fitz Gerald relates the experiences of himself and his party upon the journey which he made in 1896-97 in the neighbourhood of Aconcagua, the highest mountain at present known in South America, which it was his aim to map and to ascend. He describes in considerable detail the various operations of the expedition, and recounts with rare frankness the sensations of himself and of his assistants at low atmospheric pressures. Various other matters of considerable public interest are introduced incidentally in his volume, such as the Trans-Andine Railway and the Boundary dispute between Chili and the Argentine Republic; but the attention of the reader will be mainly engrossed by his history of the attacks upon the two great mountains Aconcagua and Tupungato, neither of which was conquered easily.

Although it is visible from Valparaiso, Aconcagua can scarcely be said to have been known at the beginning of the nineteenth century. Humboldt was certainly unacquainted

Engineer, got up and said of Aconcagua that "he believed it to be little less than 15,000 feet high. Admiral Fitzroy had described it as being higher than any of the Himalayan peaks; but he must have been mistaken in his calculations, no doubt in consequence of the difficulty in getting a suitable base for a trigonometrical measurement. He (Mr. Miers) had often seen it void of snow, and as the snow-line in that latitude is about 15,000 feet, it is manifest that the mountain cannot much exceed that height." Though Sir Clements Markham (the present President of the Royal Geographical Society) was at the meeting, it does not appear that either he or any one else entered a protest against this startling statement (see *Proc. R. Geog. Soc.*, December 9, 1872, pp. 66-7). Subsequently, Aconcagua rose to a height exceeding 24,000 feet in the pages of the *Daily Chronicle* (January 18, 1897), and it has now, according to Mr. Fitz Gerald, dropped to 23,080 feet, or to almost exactly the height assigned to it by Admiral Fitzroy. This appears to be the greatest elevation that any one has hitherto reached upon a mountain.

Mr. Fitz Gerald's Expedition sailed from Southampton on



FIG. 1.—Looking down Horcones Valley from glacier.

with its name when he was travelling in Peru. He said many years afterwards that, at that time, Chimborazo was everywhere accounted to be the loftiest mountain in the world. But in his "Aspects of Nature," published in England in 1849, he knew differently, and referred to the Great Andes of Peru and Bolivia which were brought to light by Mr. Pentland; and to Aconcagua, which had been found by the officers of the *Adventure* and *Beagle* on Fitzroy's expedition to be between 23,000 and 24,000 feet in elevation. Since then the mountain has had its ups and downs; or, to employ the language of the geologist, it has had its periods of elevation and subsidence. It got to its lowest level about twenty-seven years ago at a meeting of the Royal Geographical Society. After the reading of a paper by Mr. R. Crawford, C.E., upon a projected railway route across the Andes, Mr. J. W. Miers, another Civil

<sup>1</sup> "The Highest Andes; a Record of the First Ascent of Aconcagua and Tupungato in Argentina, and the Exploration of the Surrounding Valleys." By E. A. Fitz Gerald. 8vo, pp. 390. (London: Methuen and Co., 1899.)

October 15, 1896; left Buenos Aires November 29; and on December 7 arrived at Punta de las Vacas (7858 feet), the terminal station in Argentina of the Trans-Andine Railway.<sup>1</sup> This terminus is only a little more than twenty miles to the south-east of the summit of Aconcagua. No other mountain in the world of anything like its magnitude is approached so closely by railway.<sup>2</sup> An abortive attempt to get to it was first of all made *via* the Vacas Valley, which runs a little west of north from the Terminus and leads to the eastern side of the mountain; and it was subsequently found that the true way towards the summit was by the Horcones Valley, the upper part of which lies to the *west* of the main peak. After some pre-

<sup>1</sup> This line is intended to connect Buenos Aires and Valparaiso. Its construction has been suspended for several years, but it has been quite recently stated that progress will shortly be resumed. About 44 miles remain to be made.

<sup>2</sup> The railway which is being constructed towards Chamonix terminates at present at the village le Fayet, which is less than *ten* miles distant from the summit of Mont Blanc. The summit of Mont Blanc is 13,875 feet above le Fayet, and that of Aconcagua is 16,222 feet above Punta de las Vacas.

liminary exploration, a camp was established at the head of this valley, at a height of about 14,000 feet. "The lack of pasturage," it is said, "made it impossible to take the mules any farther," and thenceforward all transport had to be effected by men.

Besides Mr. Fitz Gerald, the Expedition at this time consisted of Messrs. Vines, de Trafford and Gosse; Zurbriggen, the brothers Joseph and Louis Pollinger, Lanti and Weibel. Matthias Zurbriggen, who was born in Switzerland and lives in Italy, is termed guide, and the rest of the men are called porters; although the two Pollingers and Lochmatter are actually guides, and amongst the best of the younger ones of the Zermatt district. Lanti, who is also called a porter, appears to have been a miner. Mr. Lightbody, an engineer of the Trans-Andine Railway, joined the party at a later date.

On the first day (December 23), Fitz Gerald and Zurbriggen, with four porters and twelve horses or mules, started from the mouth of the Horcones Valley (8948 feet), and went to the spot at its head that has been already mentioned, which was about 14,000 feet above the sea; and, leaving the animals

difficulty I had in breathing, and partly on account of the dreadful snoring of the men. They would begin breathing heavily, and continue on in an ascending scale till they almost choked. This would usually wake them up, and they were quiet for ten minutes or so, till gradually the whole performance recommenced" (pp. 55-6).

On the following day (December 25) they continued the ascent; and, although the distance that they mounted was small, the effects became more marked. Mr. Fitz Gerald says of himself and also of Zurbriggen: "We were feeling distinctly weak about the knees, and were obliged to pause every dozen steps or so to catch our breath, and frequently we sat down for about ten minutes to recover" (p. 56). On the next night they encamped on the desired spot, which is said to have been 18,700 feet above the sea. During the day, Zurbriggen advanced (according to his estimate, 2000 feet above the camp), and returned "late in the evening, completely exhausted." On the 27th Mr. Fitz Gerald and the rest retreated to 12,000 feet in the Horcones Valley, in doing which, it seems to me, they made a

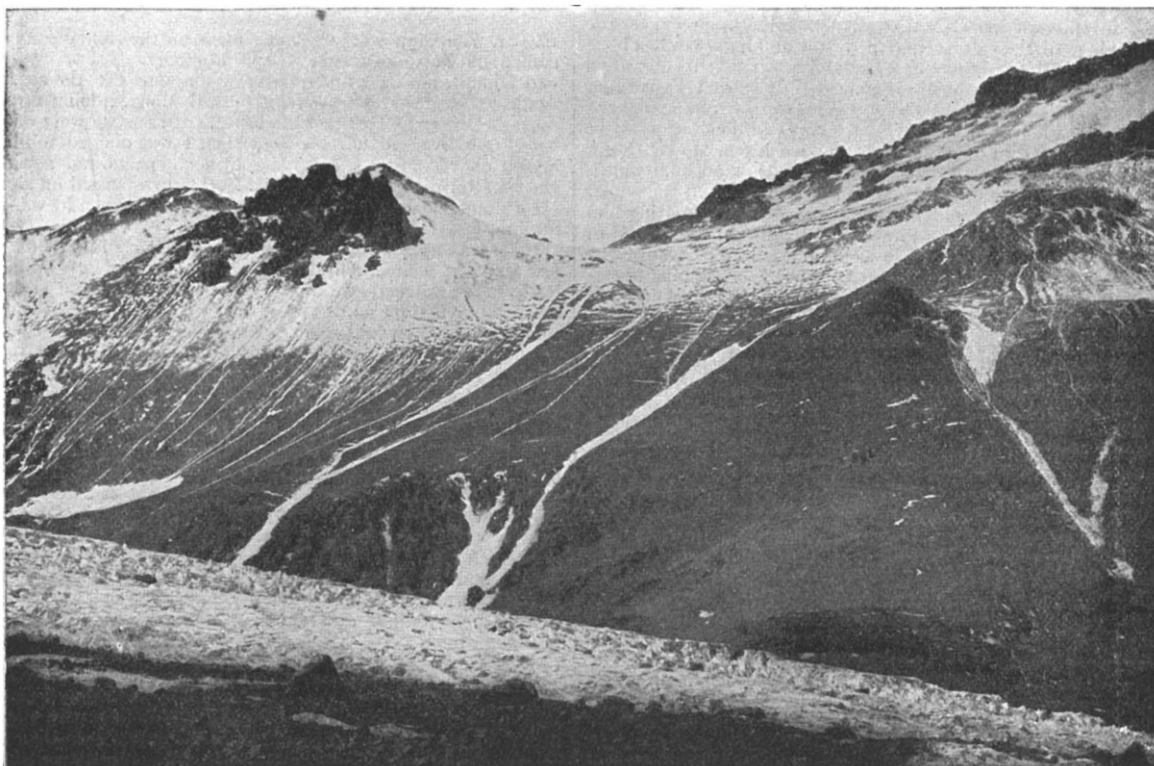


FIG. 2.—Saddle on which the 18,700 ft. camp was situated.

there, some of the party pushed on, with the view of arriving at a depression upon the ridge which leads from the summit towards the north-west; but when an altitude of 16,000 feet is supposed to have been reached, a halt was called on account of the lateness of the hour. "Being much fatigued, we decided not to pitch our tent, but simply to crawl into our sleeping-bags. No one had the energy even to make for himself a smooth place. . . . During the night, one of my Swiss porters, a tall, powerfully-built man, Lochmatter by name, fell ill. He suffered terribly from nausea and faintness." Next day they progressed upwards, but still did not reach the spot for which they were aiming, and passed the night at some elevation that is not mentioned. It was now Mr. Fitz Gerald's turn to feel the effects of diminution in atmospheric pressure.

"I had suffered acutely," he says, "during the afternoon from nausea, and from inability to catch my breath, my throat having become dry from continual breathing through my mouth. . . . I was unable to sleep at all, partly because of the

mistake, and sacrificed some of the advantages which had been gained by considerable labour.

On December 30 they re-started, reached the 18,700 feet camp at the end of the day, and left at 5.45 the next morning with the view of reaching the summit. "At that time we little knew what lay before us; the summit looked so very near that we even talked of five or six hours as a possible time in which to reach it. We set out towards our peak over the loose, crumbling rocks that covered the north-west face; the steepness was too great for a direct line of march, and we were obliged to twist and zigzag."

"I noticed Zurbriggen was going very fast; I was obliged to call to him several times, and ask him to wait for me, as I did not wish to exhaust myself by pressing the pace so early. I was surprised at his hurrying in this way, as it is generally Zurbriggen who urges me to go slowly at first. However, I soon discovered the reason for this; he was suffering bitterly from cold. Seeing that his face was very white, I asked him if



he felt quite well. He answered that he felt perfectly well, but that he was so cold he had no sensation whatever left in his feet; for a few moments he tried dancing about, and kicking his feet against the rocks, to get back his circulation. I began to get alarmed, for frozen feet are one of the greatest dangers one has to contend against in Alpine climbing. The porters who had been lagging behind now came up to us; I at once told Zurbriggen to take his boots off, and we all set to work to rub his feet. To my horror I discovered that the circulation had practically stopped. We continued working hard upon him, but he said that he felt nothing. We took off his stockings, and tried rubbing first with snow and then with brandy; we were getting more and more alarmed, and were even beginning to fear that the case might be hopeless, and might even necessitate amputation. At last we observed that his face was becoming pallid, and slowly and gradually he began to feel a little pain. We hailed this sign with joy, for it meant, of course, that vitality was returning to the injured parts, and we renewed our efforts; the pain now came on more and more severely; he writhed and shrieked and begged us to stop, as he was well-nigh maddened with suffering. Knowing, however, that this treatment was the one hope for him, we continued to rub, in spite of his cries, literally holding him down, for the pain was getting so great that he could no longer control himself, and tried to fight us off. The sun now rose over the brow of the mountain, and the air became slightly warm; I gave him a strong dose of brandy, and after a great deal of trouble induced him to stand up. We slipped on his boots without lacing them, and supporting him between two of us, we began slowly to get him down the mountain side. At intervals we stopped to repeat the rubbing operation, he expostulating with us vainly the while. After about an hour and a half, we succeeded in getting him back to our tent, where he threw himself down, and begged to be allowed to go to sleep. We would not permit this, however, and taking off his boots again we continued the rubbing operations, during which he shouted in agony, cursing us volubly in some seven different languages. We then prepared some very hot soup, and made him drink it, wrapping him up warmly in all the blankets we could find and letting him sleep in the sun. In the afternoon he seemed quite right again, and was able to walk about a little" (pp. 61-2).

This episode brought that day's attempt to an end, but the next morning (January 1) they started again at 8 a.m., with temperature at 26° F., passed the place where they had turned back on December 31, and then encountered great and steep slopes of loose, rolling stones; which, so far as the mountain itself was concerned, seem to have formed the greatest difficulty on the ascent. "The first few steps we took caused us to pause and look at one another with dismay. Every step we made, we slipped back, sometimes the whole way, sometimes more. . . . We continued plodding on for some time, our breath getting shorter and shorter as we struggled and fought with the rolling stones in our desperate attempts not to lose the steps we gained. . . . There was nothing to fix our attention upon except the terrible, loose, round stones, that kept rolling, rolling as if to engulf us." Now another one became ill. "Louis Pollinger" (who is an unusually sturdy and powerful young fellow) "was turning a sickly, greenish hue. All the colour had left his lips, and he began to complain of sickness and dizziness." They went on until 2.15 p.m., and then turned back. "Zurbriggen, I think, could have gone a little farther, but even he admitted that he did not think he would be capable of reaching the summit. . . . The temperature had now dropped to 17° F., and the sun gave us no warmth to speak of. Coming down was almost worse than going up. Fatigued as we were, and chilled and numb to the bone, we constantly fell down, and it was four o'clock before we reached our encampment. . . . We were all of us suffering from splitting headaches."

Although Mr. Fitz Gerald speaks frequently of heat and cold, he does not often quote actual temperatures; but at this point he remarks that the temperature fell to 5° F. during the night, that the maximum in the sun had only been 47° F. during the previous three days, and that it had barely reached 29° F. in the shade. Though the cold which was experienced was not at all lower than might have been expected, they found it trying. "The cold at this altitude seems absolutely unendurable after sunset. I have seen the men actually sit down and cry like children, so discouraged were they by this intense

cold" (p. 57); and he says, truly, at another place, that "with the barometer standing at fifteen inches, the rarefied atmosphere lowers all the vital organs to such an extent that 20° of frost feels more like 60°" below freezing point (p. 63). There were four of them in their miserable little tent, packed so close that each time one turned over he was obliged to wake the rest." "A terrible and stunning depression had taken hold upon us all, and none of us cared even to speak. At times I felt almost as if I should go out of my mind. . . . All ambition to accomplish anything had left us, and our one desire was to get down to our lower camp, and breathe once more like human beings" (p. 67); and so down they went, this time to Puente del Inca, 8948 feet, at the mouth of the Horcones Valley, and waited there a week.

On January 9 they started again, passed that night half-way up the Horcones Valley, and on the next day went up to the 18,700 feet camp, ascending from 14,000 feet at the rate of 854 feet per hour! "We all seemed so well that I thought it better not to make an attempt on the mountain next day, but to see what a few days of rest and good food would do for us. My hope was that the system would accustom itself to the rarefied air." The minimum of that night was 1° F., which is the lowest temperature recorded in the volume. At 9 a.m. on January 12, Mr. Fitz Gerald set out once more for the summit, accompanied by Zurbriggen and Joseph Pollinger. "For my own part I knew, after the first quarter of an hour, that the attempt would be fruitless. However, I pushed along, hoping against hope that by some chance I might feel better as we went on. I had barely reached 20,000 feet, when I was obliged to throw myself on the ground, overcome by acute pains and nausea," and he returned to the tent, while Zurbriggen pushed on alone. He did not, however, reach the summit; and, when he was returning, was watched through a field-glass.

"He was apparently quite exhausted; he could only take a few steps at a time, and then seemed to stumble forward helplessly. We watched him thus slowly descend for about an hour and a half; first he sat down for four or five minutes, then he slowly plodded onward again. At last he reached a large patch of snow, where, by sliding, he was able to make better time. He did not reach the tent till after sunset, and then he was speechless with thirst and fatigue" (p. 78).

On January 13, another attempt gave a similar result; but at night preparations were made for a renewed assault on the morrow; and on the 14th, Zurbriggen, Joseph Pollinger, Lanti and Mr. Fitz Gerald started at 7 a.m., "all in excellent spirits—so far as it is possible to be cheerful at 19,000 feet." Things went well until 12.30, when they had reached an elevation which was estimated to be about 22,000 feet, and then Mr. Fitz Gerald collapsed. It is to the credit of the head of the Expedition that he writes so frankly, and one cannot but regret that his perseverance did not meet with success. This is his own description:

"I got up, and tried once more to go on, but I was only able to advance from two to three steps at a time, and then I had to stop, panting for breath, my struggles alternating with violent fits of nausea. At times I would fall down, and each time had greater difficulty in rising; black specks swam across my sight; I was like one walking in a dream, so dizzy and sick that the whole mountain seemed whirling round with me. The time went on; it was growing late, and I had now got into such a helpless condition that I was no longer able to raise myself, but had to call on Lanti to help me. . . . Lanti was in good condition, and could, I feel sure, have reached the summit. He was one of the strongest men we had with us. For a long time past he had been begging me to turn back, assuring me that our progress was so slow, that even should I keep it up I could not reach the top before sunset. I was right under the great wall of the peak, and not more than a few hundred yards from the great couloir that leads up between the two summits. I do not know the exact height of this spot, but I judge it to be about a thousand feet below the top. Here I gave up the fight and started to go down.

"I shall never forget the descent that followed. I was so weak that my legs seemed to fold up under me at every step, and I kept falling forward and cutting myself on the shattered stones that covered the sides of the mountain. I do not know how long I crawled in this miserable plight, steering for a big patch of snow that lay in a sheltered spot, but I should imagine that

it was about an hour and a half. On reaching the snow I lay down, and finally rolled down a great portion of the mountain side. As I got lower my strength revived, and the nausea that I had been suffering from so acutely disappeared, leaving me with a splitting headache. Soon after five o'clock I reached our tent. My headache was now so bad that it was with great difficulty I could see at all.

"Zurbriggen arrived at the tent about an hour and a half later. He had succeeded in gaining the summit, and had planted an ice-axe there; but he was so weak and tired that he could scarcely talk, and lay almost stupefied by fatigue. Though naturally and justifiably elated by his triumph, at that moment he did not seem to care what happened to him. At night, in fact, all hope and ambition seemed to depart, after four days spent at this height, and that night we got little sleep, every one making extraordinary noises—struggling, panting, and choking for breath, until at last obliged to wake up and moisten his throat with a drop of water" (pp. 82-3).

affected by the diminution in the atmospheric pressure which they experienced, and they were sometimes rendered almost incapable. Upon the map, Tupungato is credited with a height of 21,550 feet, but I have not been able to find in the volume the data from which this elevation has been derived. If it has no better foundation than readings of an aneroid barometer, it is probable that the height has been considerably over-estimated. The elevation assigned to Aconcagua is obtained from the railway-levels as far as the terminus at Punta de las Vacas (7858 feet), carried on by levelling and triangulation up the Horcones Valley, and may be considered authoritative. Notwithstanding its great height, the mountain bears little snow in the middle of the summer; and in this respect the observations by Mr. Miers which are quoted at the beginning of this article are supported. Mr. Fitz Gerald, indeed, says that "when Zurbriggen made the ascent of Aconcagua, he went to the summit of the mountain without placing his foot upon snow; the side of the mountain was bare to the top on the north-west slopes" (p. 34). The apex of Tupungato was also bare rock. From

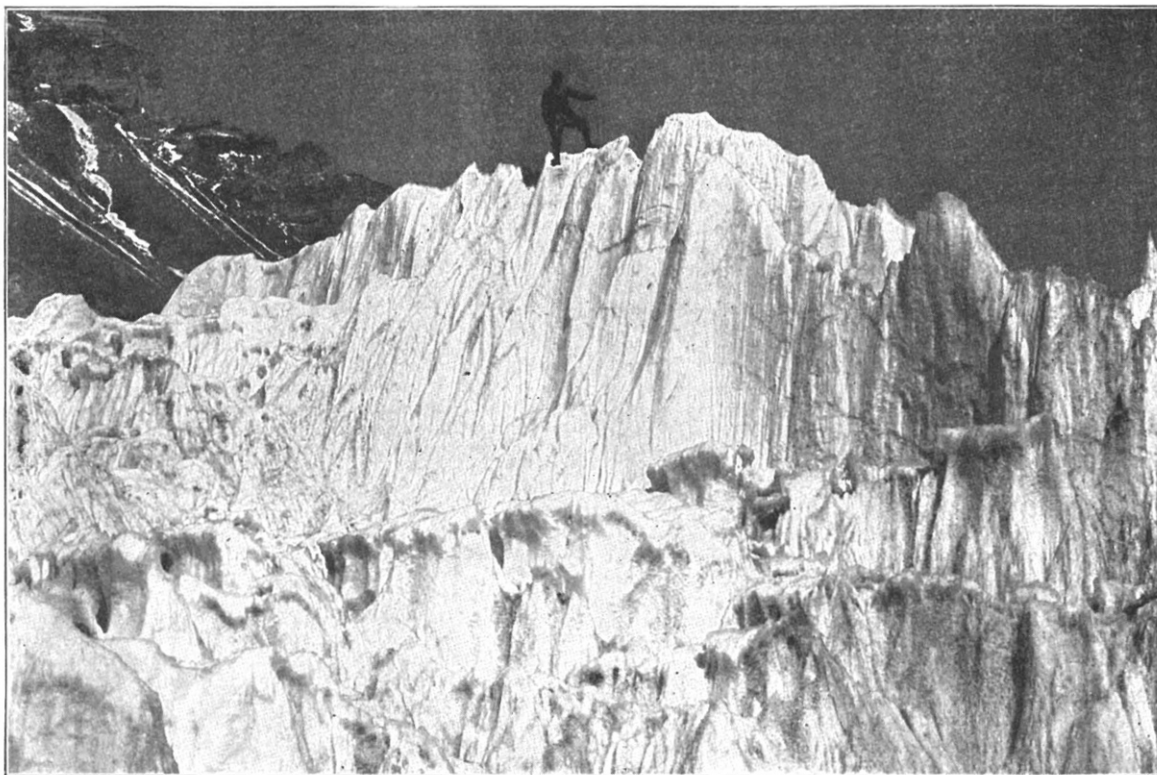


FIG. 3.—Seracs of the Horcones Glacier.

Thus, Zurbriggen alone reached the highest point in the world which has hitherto been ascended; and it is not the least curious fact in this interesting journey that he should have done so, for he was not the most nimble of the party, and in appearance and gait is not the one who might have been expected to be the most successful. That he did succeed was proved on the following 13th of February, when Mr. Vines and Lanti again ascended the mountain, and found an ice-axe on the summit and a substantial pyramid of stones which he had built. The cairn might have been erected by any one, but the axe could have been put there only by himself.

The position assigned to Aconcagua on the map which accompanies Mr. Fitz Gerald's volume is long.  $69^{\circ} 59'$  west of Greenwich,  $32^{\circ} 39'$  south latitude, and Tupungato is placed about 57 miles to its south. This latter mountain was ascended by Mr. Vines and Zurbriggen on April 12, 1897, but only after three attempts which ended in failure. Upon it, as on Aconcagua, all those who got to considerable elevations were strongly

the absence of great snow-fields and large glaciers in this elevated region, it would appear that the annual snow-fall there is inconsiderable.

Mr. Fitz Gerald's book will give abundant food for reflection to those who think that the loftiest mountains in the world can be scaled, and scaled easily. He confirms the observations of others, that the greatest heights are reached painfully and laboriously, and that there is a pretty constant diminution in pace the higher one ascends. The illustrations in the volume are reproductions of photographs, and out of the forty-five views of scenery which are given, thirty-three are by Mr. Lightbody. The appendix contains notices of the rocks, by Prof. T. G. Bonney; of the reptiles, scorpions and spiders, by Messrs. Boulenger and Pocock; and of the plants, by Mr. Burkill. The collections seem meagre, and nothing except a few rock specimens appears to have been brought from the greatest heights.

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